

APPLICATIONS OF PROCESSING PACKETS WHICH CONTAIN GEOGRAPHIC LOCATION INFORMATION OF THE PACKET SENDER

CROSS-REFERENCE TO RELATED APPLICATIONS

Related Applications

[0001] The present application is related to U.S. patent application Ser. No. _____, filed _____, entitled “USE OF PACKET HEADER EXTENSION FOR GEOLOCATION/GEOTARGETING,” naming Michael Friedel and Hasnain Karampurwala as inventors, and having attorney docket number ATEN-0004-01.01US. That application is incorporated herein by reference in its entirety and for all purposes.

FIELD OF THE INVENTION

[0002] Embodiments according to the present invention generally relate to IPv6 networks and more particularly to providing geo-location and geo-targeting services within IPv6 networks.

BACKGROUND OF THE INVENTION

[0003] Internet Protocol version 6 (IPv6) is the latest version of the Internet Protocol (IP), the communications protocol that provides an identification and location system for computers on networks and routes traffic across the Internet. IPv6 was developed to address the long-anticipated problem of IPv4 address exhaustion. The management of IPv6 address allocation process is delegated to the Internet Assigned Numbers Authority (IANA). The main function of the IANA is the assignment of large address blocks to the regional Internet registries (RIRs), which have the delegated task of allocation to network service providers and other local registries. The RIRs assign smaller blocks to local Internet registries that distributes them to users.

[0004] One drawback to the IPv6 protocol is that it does not have any built-in geo-location services. There is no field in IPv6 headers, extensions, etc. that transmits the user's location information just as there are no fields in IPv4 that provides geo-location services. Depending on the manner in which an Internet Service Provider (ISP) decides to allocate its block of addresses, they may or may not choose to use geography as a driving force. There is nothing in a conventional IPv6 address that will intrinsically provide the geographic breakdown simply by inspecting the IP address. While the regional registries are given large blocks to allocate, these blocks may only give, at best, continent level information. This is problematic because there is no way to determine the location of a client simply by analyzing the IP address. For example, a US company could receive a large block of address from American Registry for Internet Numbers (ARIN) and then route them all over the world. As a result, an address block may designate California, but certain IP addresses associated with the block may actually be used by the company's Shanghai office.

[0005] Consequently, it is challenging for network managers and Internet Service Providers (ISPs) to configure their networks to make decisions based on the geo-location of the Internet traffic.

BRIEF SUMMARY OF THE INVENTION

[0006] Accordingly, a need exists for a method and apparatus that includes geo-location information in IP packets transmitted by a client device in an efficient and flexible manner. Further, a need exists for authenticating packets that originate from a client device based on the geographic location of the client. Additionally, a need exists for prioritizing or efficiently routing packets based on the geographic location of the client device.

[0007] In one embodiment, an extension header in an IPv6 packet is used to transmit the geo-location of the client device. In one embodiment, the geographic location transmitted in the extension header is used to authenticate the packets that originate from the sender. Further, in one embodiment, the geographic location transmitted in the extension header is used to prioritize data packets from the sender relative to packets from other sources. Finally, in one embodiment, the geographic location is used to efficiently route data packets by using the sender's location.

[0008] In one embodiment, a method for routing Internet traffic is disclosed. The method comprises receiving an IPv6 packet. Further, the method comprises determining if the IPv6 packet comprises an extension header with geo-location information. Finally, responsive to a determination that the IPv6 packet comprises an extension header with geo-location information, the method comprises performing an action based on the geo-location information, wherein the action is selected from the group consisting of: authenticating the IPv6 packet, prioritizing the IPv6 packet relative to other packets, routing the IPv6 packet, and monitoring of the IPv6 packet.

[0009] In another embodiment, a non-transitory computer-readable storage medium having stored thereon instructions that, if executed by a computer system cause the computer system to perform a method for routing Internet traffic, is presented. The method comprises receiving a packet that is IPv6 over a communication network. It also comprises determining if the packet comprises an extension header with geo-location information. Further, responsive to a determination that the packet comprises an extension header with geo-location information, the method comprises performing an action based on the geo-location information, wherein the action is selected from the group consisting of: authenticating the packet, prioritizing the packet relative to other packets, routing the packet, and monitoring of the packet.

[0010] In another embodiment, an apparatus for routing Internet traffic is disclosed. The apparatus comprises a memory and a processor on a client device communicatively coupled to the memory. The processor is configured to: (a) receive an IPv6 packet over a communication network; (b) determine if the IPv6 packet comprises an extension header with geo-location information; and (c) responsive to a determination that the packet comprises an extension header with geo-location information, the processor is configured to perform an action based on the geo-location information, wherein the action is selected from the group consisting of: authenticating the packet, prioritizing the packet relative to other packets, routing the packet, and monitoring of the packet.

[0011] The following detailed description together with the accompanying drawings will provide a better understanding of the nature and advantages of the present invention.